Memorandum

MIAMI-DADE COUNTY

Date: April 24, 2007

Agenda Item No. 12(B)1

To: Honorable Chairman Bruno A. Barreiro and Members, Board of County Commissioners

From: George M. Burgess County Manager

Subject: Report: Projected Timelines and Costs to Design, Permit, and Construct the Reuse Facility at the South District Wastewater Treatment Plant and the Evaluation of Alternative Water Supply Options and Projects and their Environmental Benefits

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On December 19, 2006, the Board of County Commissioners (Board) adopted Resolution R-1467-06 which affirms the County's commitment to increase significantly the amount of wastewater it reuses to recharge wetlands and the Biscayne Aquifer and to develop alternative water supply options to augment the County's water supply. The resolution reflects the Board's firm commitment to meet the requirements of Consent Order OGC #03-1376 issued by the Florida's Department of Environmental Protection (FDEP) requiring upgrades to the South District Wastewater Treatment Plant (SDWWTP) and the Interim Water Use Authorization and Agreement (Agreement) with the South Florida Water Management District (District) requiring the development of alternative water supplies.

As stipulated in Resolution R-1467-06, the Miami-Dade Water and Sewer Department (MDWASD) prepared this progress report which includes the projected timelines and costs to design, permit, and construct the wastewater reuse facilities at the SDWWTP. In addition, the report contains an evaluation of alternative water supply options and a list of proposed projects (as shown in Exhibit A) by millions of gallons per day (MGD) capacity, the date the new facilities are available for operation, and the associated project costs for the next 20 years.

The environmental benefits associated with these reuse projects is that the County's water resources are used more than once. In the case of wetlands re-hydration, the benefit lies in restoring a part of the historic Everglades system to more closely resemble the eco-system that existed prior to urban development. For the alternative water supply projects, the advantage is that additional water from the regional Everglades system will not be required to meet future drinking water demands.

Exhibit A contains a series of MDWASD's proposed alternative water supply projects represented in incremental steps. Each increment signifies an alternative water supply project that increases the MGD capacity of the County's water supply, with the proposed facility start-up date and estimated related costs. The phasing of these projects is designed to always generate a reasonable and responsible surplus of supply over demand as a hedge against any uncertainties in the planning assumptions.

Steps 1-3: Project Years 2005-2011 (22.2 MGD/$109.7 Million)

The project shown in Step 1 of Exhibit A is the Floridan Aquifer Blending / Aquifer Storage Recovery Project at the Alexander Orr Water Treatment Plant (WTP). As can be seen, the project has been completed and the blending of brackish and fresh water is underway. This project uses the brackish Floridan Aquifer water to blend with fresh Biscayne Aquifer water and/or for storage of fresh Biscayne Aquifer water in the Floridan Aquifer in the wet season for extraction and use in the dry season. Project costs totaled $6.4 million and added 7.4 MGD of blending capacity to the County's water supply. The project noted in Step 2 is the Floridan Aquifer Blending Wellfield Project at the Hialeah/Preston WTP's. This project will further increase capacity by 4.8 MGD by blending the Floridan Aquifer water at an estimated cost of $10.3 million by 2009. Step 3 represents Phase 1 of the New Upper Floridan Reverse Osmosis (RO) WTP, which will be constructed in the City of Hialeah. Ownership, financing, and operational issues associated with this RO WTP is the subject of the ongoing negotiations between the County and the City of Hialeah. Regardless of the outcome, this WTP will directly utilize the Floridan Aquifer using the RO treatment to remove salt. The project is currently expected to account for 10 MGD of additional supply at an estimated cost of $93 million and will be operational in 2011.

Steps 4-6: Project Years 2012-2020 (43 MGD/$680.5 Million)

Phase 1 of the Groundwater Recharge Project at the South Miami Heights WTP is scheduled to be ready for implementation in 2014 expanding the water supply by 18 MGD at a cost of $357.5 million, as shown in Step 4. A preliminary "Request for Proposal" has been drafted and is under review to solicit a design consultant for this project. Design could be completed by mid-2009. This project will provide advanced treatment of the effluent to produce drinking water quality and will pipe a portion of that water to replenish ground water for water supply purposes. The technologies to be used include micro-filtration and RO which filters out small particles and uses ultraviolet light for disinfection. High quality water would be piped to areas west of the South Miami Heights WTP and discharged into the ground water through underground trenches. Based upon this replenishment of water, more water can be withdrawn and treated for drinking water purposes at this treatment plant. This approach will enable the continuous use of the South Miami Heights WTP which can be constructed over the next four to five years. Step 5 represents Phase 2 of the New Upper Floridan RO WTP, in the City of Hialeah, which will yield 5 MGD in additional capacity at a cost of $25 million with the facilities available for use in 2018. The last project in this step series is Phase 2 of the Groundwater Recharge Project for the Alexander Orr WTP which will add 20 MGD to the water supply with total costs estimated at $298 million. The methodology used at the South Miami Heights WTP will also be used for the Alexander Orr WTP to replenish groundwater. These facilities will be available to initialize operations in 2020.

Steps 7-8: Project Years 2021-2030 (17.5 MGD /$227.2 Million)

As shown in Step 7, Phase 3 of the Groundwater Recharge Project for the Alexander Orr WTP will add 15 MGD to the water supply and is scheduled to be operational in 2026 at a cost of $217.5 million. The project listed in Step 8 is Phase 3 of the New Upper Floridan RO WTP, in

the City of Hialeah, which will produce an additional 2.5 MGD in capacity at a cost of $9.7 million with facilities available for operation in 2028.

Note(s) Section in Exhibit A

Note #1 – Projects that reduce overall water demand

The projects listed under this note serve to reduce the demand for water. These projects include but are not limited to various water conservation projects currently being implemented by MDWASD. The County's Water Use Efficiency Five-Year Plan was approved by the Board for the next 5 years and is already being expanded to cover the next 20 years, with a projected reduction in demand of 11.5 MGD over that time period. That represents more than 10% of the additional supply required to meet future demands. Examples of some of the ongoing conservation projects include the Bathroom and Kitchen Retrofits Program, the Miami-Dade Green Lodging and Restaurant Program, the Low Income Seniors Full Retrofit Program, Rebates for High Efficiency Toilets and High Efficiency Washers and Landscaping Irrigation Evaluations. Also included in this category is a 1 MGD Reuse Irrigation Project at the Central District Wastewater Treatment Plant estimated to cost approximately $15.3 million, and a 7 MGD Reuse Irrigation Project at the North District Wastewater Treatment Plant with estimated costs reaching $26.8 million. These projects are projected to be completed by 2010 and 2011, respectively.

Note #2 – Projects used for water treatment /reuse credits

The projects listed under this note do not augment the County's water supply but are necessary to either meet regulatory requirements or water treatment demands. The construction of the High Level Disinfection (HLD) Facility was prompted by FDEP's Consent Order, OGC #03-1376, which became effective April 29, 2004. The Consent Order requires the County to upgrade its current treatment process at the SDWWTP to meet certain HLD criteria which reduces total suspended solids and coliform bacteria prior to injecting the effluent into the disposal wells. The HLD Facility is projected to be completed by 2012 with total project costs reaching $505 million for a wastewater treatment capacity of 285 MGD. Another project related to water treatment is the construction of the new 20 MGD WTP in South Miami Heights which will allow MDWASD to meet the County's future treatment demands as demand continues to grow. The project will be completed in 2011 with an estimated total project cost of $185.2 million.

The Coastal Wetland Rehydration Program and the Aquifer Recharge Pilot Study are examples of projects that will serve to generate reuse credits. Costs for the Aquifer Recharge Pilot Study are estimated at $1.5 million with a project completion date of 2009. The 1 MGD Coastal Wetland Rehydration Demonstration Project is estimated to cost $19.2 million with a project end date in 2009 whereas costs for the full scale 52 MGD plant are estimated at $621 million with a project completion date in 2021. The wetland rehydration process requires thorough removal of nutrients from the reuse water and is consistent with the Comprehensive Everglades Restoration Program (CERP) which envisions reused wastewater as a practical water supply source for this purpose. A pilot project to test different treatment technologies and to gain insights into the biological and ecological response of typical wetlands to highly

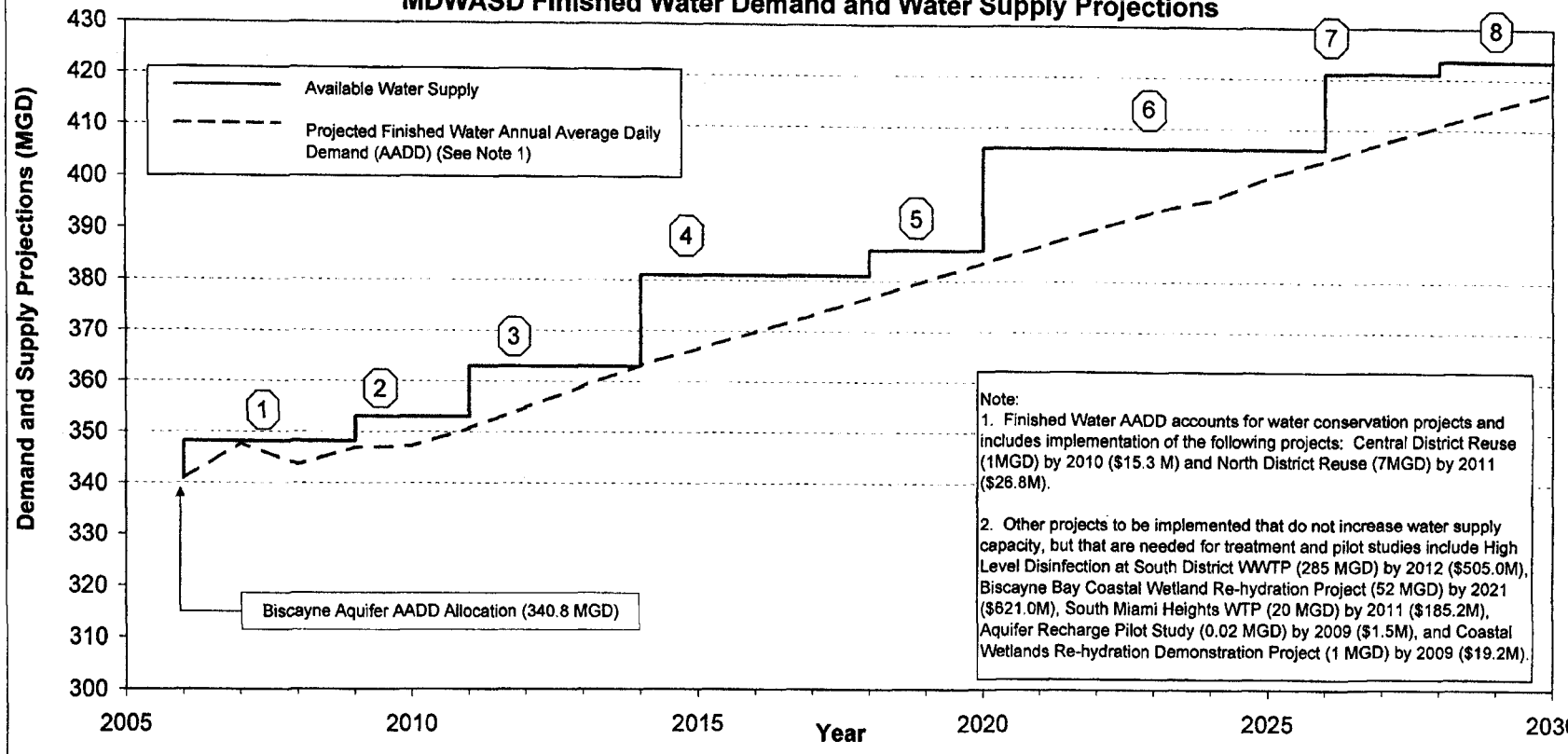
treated effluent has been contemplated in the CERP and is a current requirement in the Agreement with the District. The results of the pilot project will help to optimize the treatment system and the preferred areas for rehydration to maximize the benefits to the wetlands and to the Bay. This pilot project advances the current CERP schedule by several years and provides a unique opportunity to accelerate this aspect of Everglades's restoration.

The District recently completed a study of desalination of ocean water in several locations where facilities could be co-located with power plants already using sea water for cooling purposes. The study also evaluated the permitting feasibility of co-locating a desalination plant with the Central District Wastewater Treatment Plant on Virginia Key. Cost estimates were not provided for Virginia Key, however, they were provided for other locations outside of the County including Port Everglades, Fort Lauderdale, and Fort Myers. The estimated capital costs for desalination facilities (excluding the cost of withdrawal facilities that are already in place at the power plants) are in the $8 to $10 per gallon range. This is similar to the cost of reclaiming wastewater for groundwater replenishment, but it does not address requirements for wastewater reuse.

MDWASD will continue to issue reports, as appropriate, on the process for obtaining the 20-year Consumptive Use Permit and cost estimates for the design, permitting, construction, and financing of the required facilities. Staff will also be providing a report regarding the Hialeah RO plant alternatives and the impacts for our Consumptive Use Permit process in the near future. The 20-year Consumptive Use Permit will provide authorization to withdraw the raw water supply needed to meet the 2027 finished water demand of 407 MGD, after applying the demand reduction from conservation and reuse. These reports will be used to keep the Mayor, the Chair, and the Board informed regarding the process as well as to ensure that we are moving in concert with the directives and commitments made to the regulatory agencies.

Assistant County Manager

Exhibit A
MDWASD Finished Water Demand and Water Supply Projections



Project Names:

1. Floridan Aquifer Blending at Alex-Orr WTP (7.4 MGD, $6.4M)
2. Floridan Aquifer Blending Wellfield at Hialeah/Preston (4.8 MGD, $10.3M)
3. New Upper Floridan RO WTP Phase 1 (10 MGD, $93.0M) (Subject to agreement w/ City of Hialeah)
4. Groundwater Recharge Phase 1 (SMH WTP) (18 MGD, $357.5M)
5. New Upper Floridan RO WTP Phase 2 (5 MGD, $25.0M) (Subject to agreement w/ City of Hialeah)
6. Groundwater Recharge Phase 2 (Alex-Orr WTP) (20 MGD, $298.0M)
7. Groundwater Recharge Phase 3 (Alex-Orr WTP) (15 MGD, $217.5M)
8. New Upper Floridan RO WTP Phase 3 (2.5 MGD, $9.7M) (Subject to agreement w/ City of Hialeah)

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